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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,839	07/16/2001	Shigeki Tanaka	501.35250CX3	2815

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 10/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,839

Applicant(s)

TANAKA ET AL.

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 24 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al., hereinafter Ishikawa (U.S. Patent 5,907,190) in view of the Japanese patent 59105349 (Document ID#), issued to Mori et al.

Regarding claims 1, 7, and 12, Ishikawa discloses in figure 1 a semiconductor device, shown in the figure, comprising a substrate 1; a semiconductor chip 2 mounted on one surface of the substrate and having bonding pads 3; a plurality of conductors 5 surrounding the chip; bonding wires 4 electrically connecting the bonding pads 3 with conductors 5; and a resin body 7 sealing the chip, the conductors, and the wires.

Ishikawa does not disclose a pitch between adjacent bonding pads increases in a direction toward four corners defined by the four sides of the main surface of the chip. Furthermore, Ishikawa does not expressly disclose the chip has a quadrilateral shape and wires along the four sides.

The Japanese patent discloses in figures 1 and 3, a quadrilateral shaped chip, "a" of figure 1, and wires along its four sides; and the pitch between adjacent bonding pads d1-d13 of figure 3 increases in a direction toward four corners defined by the four sides of the main surface of chip a. The Japanese patent also discloses such

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arrangement enables each wire interval becoming constant (see the abstract, last paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the pitch between bond pads toward the corner of the chip in Ishikawa's invention in order to have constant wire (conductor) intervals.

Regarding claims 2 and 3, the Japanese patent discloses in the last paragraph of the abstract that based on an optimum value, which is determined by successive approximation with a computer, the increasing intervals are determined. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the pitch (increasing intervals) in order to have more exact constant wire intervals.

Regarding claims 4, 8, and 13, see Ishikawa, column 4, lines 9-11, wherein it is stated filler 8 is heat distortable.

Regarding claims 5, 9, 10, 14, and 15, Ishikawa does not expressly disclose insulating layer on the surface of the substrate. It is well known in the art to form an insulating layer (glue) on the substrate and beneath the chip on the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use insulating glue on the substrate to bond the chip, and the corresponding conductive elements, on the substrate.

Regarding claims 6, 11, and 16, Ishikawa in view of the Japanese patent renders obvious the claimed invention, as above discussed, except for copper being used for the conductors (wires). It would have been obvious to one of ordinary skill in the art at

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the time the invention was made to use copper for the conductors, since copper is a good electrical conductor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
September 26, 2002

